

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A tool for punching a metering orifice extending at an acute angle through a fuel metering disc of a fuel injector along an orifice axis with respect to at least one planar surface of the metering disc, the metering orifice extending between first and second generally planar surfaces spaced along a longitudinal axis of the disc, the tool comprising:

an elongated body extending along a tool axis between a first tool end and second tool end about a tool axis to define a tool perimeter, the first tool end configured to receive a tool punching force, the second end including:

a pilot portion having a first surface disposed on a first plane generally transverse to the tool axis, the first surface including a first surface area offset to the tool axis, the first surface area of the pilot portion including an area bounded by a first arcuate portion of the perimeter of the second tool end and a first chord connecting the first arcuate portion;

a main portion having a second surface area greater than the first surface area offset to the tool axis, the second surface area disposed on a second plane wherein the second surface area of the main portion comprises an area bounded by a second arcuate portion of the perimeter of the second tool end and a second chord connecting the second arcuate portion; and

a transition portion disposed on a third plane generally oblique to the tool axis, the transition portion intersecting the longitudinal axis and connecting the pilot portion and the main portion.

2. (Original) The tool according to claim 1, wherein the second surface area comprises an area disposed on the second plane oblique to the tool axis.

3. (Original) The tool according to claim 2, wherein the second surface area comprises an area approximately 1.8 times the first surface area.

4. (Previously Presented) A tool for punching a metering orifice extending at an acute angle through a fuel metering disc of a fuel injector along an orifice axis with respect to at least one planar surface of the metering disc, the metering orifice extending between first and second generally planar surfaces spaced along a longitudinal axis of the disc, the tool comprising:

an elongated body extending along a tool axis between a first tool end and a second tool end about a tool axis to define a tool perimeter, the first tool end configured to receive a tool punching force, the second end including:

a pilot portion having a first surface disposed on a first plane generally transverse to the tool axis, the first surface including a first surface area offset to the tool axis, the first surface area of the pilot portion includes an area bounded by a first arcuate portion of the perimeter of the second tool end and a first chord connecting the first arcuate portion;

a main portion having a second surface area greater than the first surface area offset to the tool axis, the second surface area disposed on a second plane; and

a transition portion disposed on a third plane generally oblique to the tool axis, the transition portion intersecting the longitudinal axis and connecting the pilot portion and the main portion.

5. (Original) The tool according to claim 4, wherein the second surface area of the main portion comprises an area bounded by a second arcuate portion of the perimeter of the second tool end and a second chord connecting the second arcuate portion.

6. (Original) The tool according to claim 5, wherein the transition portion comprises two arcuate transition segments, each transition segment connecting the first and second chords at the respective ends.

7. (Original) The tool according to claim 6, wherein the second end comprises a generally circular perimeter about the tool axis such that the first and second arcuate portions and the transition segments are coincident with the generally circular perimeter.

8. (Original) The tool according to claim 7, wherein the generally circular perimeter comprises a circular area having a diameter extending through the tool axis of approximately 0.01 inches.

9. (Original) The tool according to claim 8, wherein transition portion comprises a generally planar surface disposed at a first transition angle with respect to the first virtual plane.

10. (Original) The tool according to claim 9, wherein the main portion comprises a generally planar surface area disposed at a second transition angle with respect to the first virtual plane of approximately 10 percent of the first transition angle.

11. (Original) The tool according to claim 10, wherein the first transition angle is approximately 26 degrees.

12. (Original) The tool according to claim 11, wherein a first virtual line bisecting the first surface area has a magnitude of approximately 0.001 inches and a second virtual line bisecting the second surface area has a magnitude of approximately 0.004 inches.

13. (Original) The tool according to claim 2, wherein the elongated body of the tool comprises one of a tool steel material and treated steel material.

14. (Original) The tool according to claim 2, wherein the pilot portion has a surface area bounded by a pilot segment contiguous to the tool perimeter and a

first chord connecting the pilot segment, the first chord being spaced from the tool axis at a distance of about 0.0039 inches.

15. (Original) The tool according to claim 14, wherein the main portion has a surface area bounded by a segment contiguous to the tool perimeter and a chord connecting the segment, the chord being spaced at a distance of about 0.0006 inches from the tool axis.

16. (Currently Amended) An arrangement for forming orifices in a workpiece, the arrangement comprising:

- a workpiece having a first surface spaced from a second surface along a longitudinal axis, the workpiece having a length longer than its width, the workpiece including respective lateral sides extending generally parallel to each other;

- a workpiece retention device having at least two stop members positively engaging the respective lateral sides of the workpiece; and

- a tool including:

- an elongated body extending along a tool axis between a first tool end and a second tool end about a tool axis to define a tool perimeter, the first tool end configured to receive a tool punching force, the second end including:

- a pilot portion having a first surface disposed: on a first plane generally transverse to the tool axis, the first surface including a first surface area offset to the tool axis, the first surface area of the pilot portion including an area bounded by a first arcuate portion of the perimeter of the second tool end and a first chord connecting the first arcuate portion;

- a main portion having a second surface area greater than the first surface area offset to the tool axis, the second surface area disposed on a second plane, wherein the second surface area of the main portion comprises an area bounded by a second arcuate

portion of the perimeter of the second tool end and a second chord connecting the second arcuate portion; and

a transition portion disposed on a third plane generally oblique to the tool axis, the transition portion extending through the longitudinal axis and connecting the pilot portion and the main portion.

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)